Amendments to the Specification:

Please replace original paragraphs 6, 10 and 15 with the following correspondingly-numbered paragraphs, which contain new drawing reference numbers. A clean copy of these paragraphs without red-line amendments is attached as Appendix B.

[06] The present embodiments will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. Understanding that these drawings depict only typical embodiments and are, therefore, not to be considered limiting of the invention's scope, the embodiments will be described with additional specificity and detail through use of the accompanying drawings in which:

Fig. 1a is a diagram illustrating a set of candidate illuminants as x-y chromaticity coordinates; ~~and~~

Fig. 2 is a diagram of an exemplary match score surface;

Fig. 3 is a flow chart showing a method of embodiments of the present invention comprising forming an illuminant set;

Fig. 4 is a flow chart showing a method of embodiments of the present invention comprising forming a design matrix; and

Fig. 5 is a flow chart showing a method of embodiments of the present invention comprising forming a matrix of monomial basis functions.

[10] An exemplary match surface is shown in Figure 2, which is a plot of x and y chromaticity and the match score. In this plot, the chromaticity of each candidate or model illuminant is plotted on the horizontal axes while the vertical axis represents the likelihood of being the image illuminant or match score. In some embodiments, illustrated in Figures 3, 4 and 5, a fixed set of illuminants 30, which may or may not occupy a conventional grid, identifies the horizontal position of a point of the match surface. An analysis 31, 41, 51 of each illuminant in the fixed set with respect to image data then identifies the z-axis coordinate of the surface point. Once the surface points are

identified, an analytic form may be matched 32, 42 and 52 to the surface. In some embodiments, we may assume an over-determined system. In some embodiments and for some image types, a quadratic form works well, however, other orders of surfaces, such as cubic and quartic may be used.

[15] Generally steps 1 and 2 will be performed offline, however, they may be performed online as well when resources and time constraints allow.

1) Form the design matrix 40 for the predetermined set of model illuminants, based on each model's chromaticity coordinates. This can be a matrix of monomial basis functions 50 in the chromaticity coordinates of each illuminant. For a quadratic form it is defined as follows:

$$\mathbf{A} = \begin{bmatrix} x_1^2 & x_1 y_1 & y_1^2 & x_1 & y_1 & 1 \\ x_2^2 & x_2 y_2 & y_2^2 & x_2 & y_2 & 1 \\ & & \vdots & & & \\ x_n^2 & x_n y_n & y_n^2 & x_n & y_n & 1 \end{bmatrix}$$

2) Compute the Moore-Penrose pseudoinverse of the design matrix. For a quadratic form this is a $6 \times N$ matrix where N is the number of illuminant models. It is defined as:

$$\mathbf{\Sigma} = \left(\mathbf{A}^{\mathrm{T}}\mathbf{A}\right)^{-1}\mathbf{A}^{\mathrm{T}}$$